

REMARKS

Applicant has received and carefully reviewed the Office Action mailed November 19, 2002, in the above-identified matter. Claims 27, 30, 34, and 48 have been amended, and claim 42 has been cancelled in this Amendment. Claims 1-41 and 43-53 remain pending. Reconsideration and reexamination of the pending claims are respectfully requested.

In paragraph 1 of the Office Action, the Examiner objected to the specification. With the above amendments, the objection is believed overcome.

In paragraph 4 of the Office Action, the Examiner rejected claim 27 under 35 U.S.C. §112, second paragraph, as being indefinite. Applicant has amended claim 27 to remove reference to "the inner diameter of the lumen," and believes that with this amendment, the claim is now in condition for allowance.

Applicant has modified claims 30, 34 and 48, and cancelled claim 42, to further clarify that which is claimed as the invention. These amendments are believed to leave the claims in condition for allowance.

In paragraph 6 of the Office Action, the Examiner rejected claims 1-30, 33-43, and 47-49 under 35 U.S.C. §103(a) as being unpatentable over Ortyn et al., U.S. Patent No. 5,677,762, in view of Omata, U.S. Patent No. 5,218,660. After carefully reviewing the cited references, Applicant respectfully disagrees.

With respect to claim 1, the Examiner states that Ortyn et al. show a light source generating radiation and a light pipe 40 for spatially homogenizing the radiation. The Examiner states that Ortyn et al. fail to teach or fairly suggest that the light pipe is angularly homogenizing, and instead relies on Omata to illustrate a polygonal light pipe for angularly homogenizing radiation using a number of elements. After closely reviewing both references, Applicant believes that Ortyn et al. teach away from angularly homogenizing the radiation, and further that modification of Ortyn et al. through the use of Omata would substantially change the principles of operation of Ortyn et al. and, therefore, the cited combination is impermissible. MPEP 2143.01.

Ortyn et al. illustrate an illumination device for providing stable illumination for microscopic evaluations. Ortyn et al. note:

The illumination device of the invention comprises a light 10, an optical conditioning system 12, a light pipe 40, a mechanical slide 52 with elements 54

and 56 positioned in place to intercept the light leaving the light pipe 40, and condenser optics 18. This configuration of the device provides for illumination suitable for 4X magnification of biological specimens 300 on a microscope slide 20.

The optical conditioning system 12 includes, a collimator lens 24, an aperture stop 26, a bandpass filter 28, a condenser lens 30, a turning mirror 32 and a neutral density filter 34.

Column 6, lines 23-33. Because the light must pass through a collimator lens 24 before it reaches the later optics, the angular properties of the light produced by light 10 are attenuated in the collimation of the light rays before reaching the homogenizer.

Ortyn et al. go on to state, "The homogenizer conserves the angular distribution of the light so it will not have a corrective effect on the angular distribution of the light." Column 7, lines 23-26. Also, Ortyn et al. describe to Figure 1:

The light homogenizer 40 provides a spatially uniform light distribution at exit aperture 41. The light homogenizer spatially scrambles entering light while maintaining the angular integrity to provide a uniform light distribution at the output. The total internal reflection of the light homogenizer 40 provides the arclets 21 by creating a multitude of arc images in a virtual plane located at the input aperture of the light homogenizer 40. Thus it appears that there are multiple sources of the arc distributed in space.

Column 10, line 61 to column 11, line 2.

Applicant also notes that Ortyn et al. include, in Figure 1, another collimating lens before the light reaches a sample: "The lens 56, with a focal length is positioned to collimate the output beam of the light pipe 40 originating at the output aperture 41." Column 8, lines 3-5.

The alternative embodiment Ortyn et al. show in Figure 2 also collimates the light pipe output: "The position of lens element 59 is chosen to collimate the output of the light pipe 40 for the light beam emanating from the output aperture 41 when the mechanical slide is positioned to remove the elements 56 and 54 from the optical path." Column 9, lines 12-16.

Each of the above quotations illustrates that Ortyn et al. use a homogenizer that is designed to preserve the angular distribution of incident light. Further, the placement of several collimators within the optical system indicates that Ortyn et al. are not seeking to homogenize the angular distribution to create a uniform angular distribution, but instead seek to eliminate non-normal angular constituents of the incident radiation.

The Examiner states that Omata teaches the use of a polygonal light pipe 5 for homogenizing angularly using a triangular pole glass block which serves as a light diffuser. Applicant does not understand which of the two elements, the light pipe or the triangular pole glass block, the Examiner is suggesting as providing angular homogenization. However, without addressing where within the disclosure of Omata the Examiner is referring to, it is clear from the above discussion of Ortyn et al. that the suggested modification of Ortyn et al. would be improper, as Ortyn et al. teach away from angularly homogenizing radiation.

In light of the above remarks, Applicants believe that independent claim 1 is clearly patentable over the impermissible combination of Ortyn et al. in view of Omata. Likewise, Applicants believe that dependent claims 2-6 are also clearly patentable over the impermissible combination.

With respect to all other rejections made by the Examiner under 35 U.S.C. §103(a) using Ortyn et al. in view of Omata, Applicant notes that the Examiner has made only one rejection using a single line of reasoning which, as noted above, requires an impermissible modification of Ortyn et al. In light thereof, Applicant believes that each of the rejections of claims 1-30, 33-43, and 47-49 should be withdrawn. Hence, Applicant believes that each of claims 1-30, 33-43 and 47-49 are patentable over the impermissible combination.

Applicant also specifically notes that in paragraph 6 and on page 4 of the Office Action, the Examiner has stated that fiber optic wire is well known in the art to reduce noise. Applicant does not believe that this statement provides an accurate description of what is well known in the art. Applicant does accept that transmission via an optical fiber can be relatively less noisy than some alternative modes of transmission, but that is not the same as what the Examiner has stated. The statement is too incomplete for Applicant to fairly respond either to agree or disagree or to determine how the statement relates to the claims.

In paragraph 7 of the Office Action, the Examiner rejected claims 31 and 32 under 35 U.S.C. §103(a) as being unpatentable over Ortyn et al., modified by Omata as discussed above, in view of Lu et al., U.S. Patent No. 6,058,352.

The Examiner's suggestion to modify Ortyn et al. with Omata is discussed above, and is believed to be an impermissible combination of references. The Examiner states that Lu et al. suggest a spectrometer using a tungsten halogen lamp. Applicant notes that Lu et al. does not

appear to provide any additional motivation to modify Ortyn et al. in the manner suggested by the Examiner. Therefore, Applicant believes that the combination of Ortyn et al. in view of Omata and Lu et al. as suggested by the Examiner impermissibly alters the teachings of Ortyn et al., and so the rejection should be withdrawn.

In light of the above remarks, Applicant believes that claims 31 and 32 are clearly patentable over Ortyn et al. in view of Omata and Lu et al.

In paragraph 8 of the Office Action, the Examiner rejected claims 44-46 under 35 U.S.C. §103(a) as being unpatentable over Ortyn et al. in view of Omata and Jina et al., U.S. Patent No. 5,526,120. The Examiner states that Jina et al. suggest the testing of a biological sample for constituents such as glucose and/or alcohol. As discussed above, Applicant believes that the modification of Ortyn et al. by the use of Omata as suggested by the Examiner is impermissible. Applicant believes that the addition of Jina et al. does not provide additional motivation for the combination, and the combination remains impermissible.

In light of the above remarks, Applicant believes that claims 44-46 are also clearly patentable over Ortyn et al. in view of Omata and Jina et al.

In paragraph 9 of the Office Action, the Examiner rejected claims 50-52 under 35 U.S.C. §103(a) as being unpatentable over Ortyn in view of Omata and Roach, U.S. Patent No. 4,319,830. The Examiner states that Roach teaches a multiple wavelength measurement system. As discussed above, Applicant believes that the modification of Ortyn et al. by the use of Omata as suggested by the Examiner is impermissible. Applicant believes that the addition of Roach does not provide any additional motivation for the combination, and so the combination remains impermissible.

In light of the above remarks, Applicant believes that claims 50-52 are also clearly patentable over Ortyn et al. in view of Omata and Roach.

In paragraph 10 of the Office Action, the Examiner rejected claim 53 under 35 U.S.C. §103(a) as being unpatentable over Ortyn et al. in view of Omata, Roach, and Fuller et al., U.S. Patent No. 5,792,668. The Examiner states that Fuller et al. teach the use of a resolution of 10 mg/dl for measuring blood glucose levels. As discussed above, however, Applicant believes that the modification of Ortyn et al. by the use of Omata and Roach is impermissible. Applicant

believes that the addition of Fuller et al. to this collection of references does not provide any additional motivation for the combination, and so the combination remains impermissible.

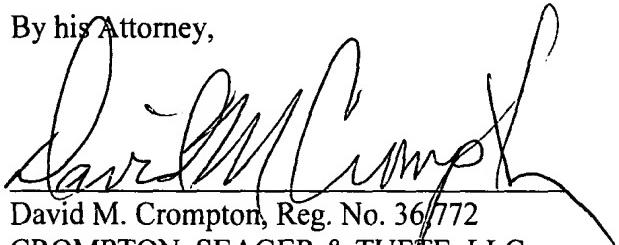
In light of the above remarks, Applicant believes that claim 53 is clearly patentable over Ortyn et al. in view of Omata, Roach, and Fuller et al.

Reexamination and reconsideration are requested. It is respectfully submitted that all pending claims, namely claims 1-41 and 43-53, are now in condition for allowance. Issuance of a Notice of Allowance in due course is also respectfully requested. If a telephone conference might be of assistance, please contact the undersigned attorney at (612) 677-9050.

Respectfully submitted,

Robert D. Johnson

By his Attorney,



David M. Crompton, Reg. No. 36/772
CROMPTON, SEAGER & TUFTE, LLC
1221 Nicollet Avenue, Suite 800
Minneapolis, MN 55403-2420
Telephone: (612) 677-9050
Facsimile: (612) 677-9050



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Version with Markings to Show Changes Made

In the Specification:

The paragraph beginning at line 4 of page 1 has been amended as follows:

This application is related to U.S. Patent Application Serial No. [] 09/832,585, entitled "System for Non-Invasive Measurement of Glucose in Humans"; U.S. Patent Application Serial No. [] 09/832,608, entitled "Optically Similar Reference Samples and Related Methods for Multivariate Calibration Models Used in Optical Spectroscopy"; and U.S. Patent Application Serial No. [] 09/832,631, entitled "Encoded Variable Filter Spectrometer", all filed on the same date herewith and assigned to the assignee of the present application. The disclosure of each of these related applications is hereby incorporated by reference.

The paragraph beginning at line 3 of page 48 has been amended as follows:

It is also recognized that other modifications can be made to the present disclosed system to accomplish desired homogenization of light. For example, the light source could be placed inside the light pipe in a sealed arrangement which would eliminate the need for the reflector. Further, the light pipe could be replaced by an integrator, wherein the source is placed within the integrator as disclosed in U.S. Patent Application Serial No. [] 09/832,631, entitled "Encoded [Multiplex] Variable Filter Spectrometer," filed on the same date herewith and incorporated by reference. Further, the present system could be used in non-infrared applications to achieve similar results in different wavelength regions depending upon the type of analysis to be conducted.

In the Claims:

Claim 42 has been cancelled.

Claims 27, 30, 34 and 48 have been amended as follows:

27. (Once Amended) The light pipe of claim 20, wherein the [inner diameter of the lumen is] light pipe includes a textured inner surface.

30. (Once Amended) A spectroscopic system for measuring analyte concentration in a sample, the system comprising:

a radiation source emitter, the emitter adapted for emitting radiation;

a radiation homogenizer disposed to receive at least a portion of said emitted radiation, wherein the homogenizer angularly and spatially homogenizes at least a portion of said emitted radiation, wherein said homogenized radiation illuminates said sample; and

[a sample source, the sample source having an analyte; and]
a detector for receiving at least a portion of the radiation subsequent to interacting with
said sample.

34. (Once Amended) The spectroscopic system of claim 30, wherein the spectroscopic system includes a means for channeling the emitted radiation to the sample [source].

48. (Once Amended) A method for homogenizing radiation for spectroscopic analysis of a sample having an analyte concentration, the method comprising the steps of:

providing a spectroscopic system, wherein the system comprises a radiation source emitter, a radiation homogenizer, [a sample having an analyte concentration,] and a radiation detector;

emitting radiation by means of the radiation source emitter;
angularly homogenizing the emitted radiation;
spatially homogenizing the emitted radiation;
illuminating the sample [source] with the homogenized radiation; and
detecting the analyte concentration within the sample source.